



## Index to Volume 27 (1995)

No 1 (January) pp 1–80  
No 2 (February) pp 81–160  
No 3 (March) pp 161–240  
No 4 (April) pp 241–320

No 5 (May) pp 321–400  
No 6 (June) pp 401–504  
No 7 (July) pp 505–568  
No 8 (August) pp 569–648

No 9 (September) pp 649–712  
No 10 (October) pp 713–792  
No 11 (November) pp 793–872  
No 12 (December) pp 873–952

### Article index

#### January

Review of statistical approaches to tolerance analysis  
*S. D. Nigam and J. U. Turner* 6  
Tessellating trimmed NURBS surfaces  
*L. A. Piegl and A. M. Richard* 16  
Rational patches on quadric surfaces  
*R. Dietz, J. Hoschek and B. Jüttler* 27  
Common tangents to planar parametric curves: a geometric solution  
*L. Parida and S. P. Mudur* 41  
Multidimensional curve fitting to unorganized data points by nonlinear minimization  
*L. Fang and D. C. Gossard* 48  
Neural network approach to the reconstruction of freedom surfaces for reverse engineering  
*P. Gu and X. Yan* 59  
Performance-directed compaction for VLSI symbolic layouts  
*L.-Y. Wang, Y.-T. Lai, B.-D. Liu and T.-C. Chang* 65  
Performing Euler angle rotations in CAD systems  
*Y. T. Lee and A. S. Koh* 75

#### February

*Special Issue: NURBS: theory and practice*  
Guest Editor: W. Tiller, GeomWare Inc, USA

Unified approach to NURBS curve shape modification  
*C. K. Au and M. M. F. Yuen* 85  
Object-oriented paradigm for NURBS curve and surface design  
*R. D. Fuhr, L. Hsieh and M. Kallay* 95  
Algorithm for degree reduction of B-spline curves  
*L. Piegl and W. Tiller* 101

Dynamic NURBS swung surfaces for physics-based shape design  
*H. Qin and D. Terzopoulos* 111  
Planar rational B-spline motions  
*M. G. Wagner* 129  
Feature based models for anatomical data fitting  
*G. T. Dobson, W. N. Waggenspack Jr and H. J. Lamousin* 139  
Application of NURBS in numerical grid generation  
*TY Yu and B. K. Soni* 147

#### March

Product modelling using STEP  
*P. Gu and K. Chan* 163  
Hierarchical geometric constraints for building design  
*K. Martini* 181  
Oriental character font design by a structured composition of stroke elements  
*S.-B. Lim and M.-S. Kim* 193  
Quadrilateral mesh generation in polygonal regions  
*B. Joe* 209  
Determining two minimal circumscribing discs for a polygon  
*Y. Xu, R. Mattikalli and P. Khosla* 223  
Adaptive sampling and mesh generation  
*S. Z. Li* 235

#### April

From engineering drawings to 3D CAD models: are we ready now?  
*D. Dori and K. Tombre* 243  
Efficient solid modelling via sheet modelling  
*K. Lee and H. S. Lim* 255  
Quasilinear parametric surfaces  
*J. Sánchez-Reyes* 263  
Interpolating scattered data with  $C^2$  surfaces  
*A. Kolb and H.-P. Seidel* 277

Model fabrication using surface layout projection  
*G. Elber* 283  
Curvature continuous connections of cones and cylinders  
*G. Aumann* 293  
Higher order Bézier circles  
*J. J. Chou* 303  
Towards a topology for computational geometry  
*S. M. Barker* 311

#### May

Systematic approach to analysing the manufacturability of machined parts  
*S. K. Gupta and D. S. Nau* 323  
Constraint-based design of parts  
*C.-X. Feng and A. Kusiak* 343  
Statistical verification of conformance to geometric tolerance  
*T. R. Kurfess and D. L. Banks* 353  
Geometric modelling using rational Gaussian curves and surfaces  
*A. Goshtasby* 363  
Pondering on discrete smoothing and interpolation  
*C. W. A. M. van Overveld* 377  
Interpolating solid orientations with circular blending quaternion curves  
*M.-S. Kim and K.-W. Nam* 385

#### June

Use of graph grammars for the description of mechanical parts  
*M. Flisinski* 403  
Bayesian approach for extracting and identifying features  
*Q. Ji and M. M. Marefat* 435  
Geometric and computational aspects of gravity casting  
*P. Bose and G. Toussaint* 455  
Freeform surface region optimization for 3-axis and 5-axis milling  
*G. Elber* 465

- G<sup>1</sup> continuity of B-spline surface patches in reverse engineering  
*M. J. Milroy, C. Bradley, G. W. Vickers and D. J. Weir* 471
- Calculating areas of box spline surfaces  
*T. N. T. Goodman and B. H. Ong* 479
- Geometric constraint solver  
*W. Bouma, I. Fudos, C. Hoffmann, J. Cai and R. Paige* 487

## July

*Special Issue: Display and visualization*

Guest Editor: Professor Alyn Rockwood, Arizona State University, USA

- Efficient rendering of trimmed NURBS surfaces  
*S. Kumar and D. Manocha* 509
- Simplified curve and surface interrogation via mathematical packages and graphics libraries and hardware  
*H. P. Moreton* 523
- Visualization and computation of curvature behaviour of freedom curves and surfaces  
*H. Hagen, S. Hahmann and T. Schreiber* 545
- Direct rendering of freedom volumes  
*Y.-K. Chang, A. P. Rockwood and Q. He* 553
- A platform for visualizing curves and surfaces  
*G. Greiner, A. Kolb, R. Pfeifle, H.-P. Seidel, P. Slusallek, M. Encarnação and R. Klein* 559

## August

- Quadric shell intersections  
*V. Kumar and D. Dutta* 573
- Approximating the helix with rational cubic Bézier curves  
*I. Juhász* 587
- Shading: fitting a smooth intensity surface  
*M. R. Kappel* 595
- Representing the Voronoi diagram of a simple polygon using rational quadratic Bézier curves  
*D.-S. Kim, I.-K. Hwang and B.-J. Park* 605
- Smoothing curvature and torsion with spring splines  
*P. H. Wagner, X. Luo and K. A. Stelson* 615
- Feature modification in incremental feature generation  
*H. Suh and R. S. Ahluwalia* 627
- Refinement of 3D meshes at surface intersections  
*S. N. Muthukrishnan, R. V. Nambiar and K. L. Lawrence* 637

## September

- Degree reduction of Bézier curves by uniform approximation with endpoint interpolation  
*P. Bogacki, S. E. Weinstein and Y. Xu* 651
- Parameterization of randomly measured points for least squares fitting of B-spline curves and surfaces  
*W. Ma and J. P. Kruth* 663
- Computation of 3D skeletons using a generalized Delaunay triangulation technique  
*J. M. Reddy and G. M. Turkiyyah* 677
- Towards feature attachment  
*X. Chen and C. M. Hoffmann* 695
- Integrating feature-based surface design with freeform deformation  
*J. C. Cavendish* 703

## October

- 2-Phase approach to global tool interference avoidance in 5-axis machining  
*Y.-S. Lee and T.-C. Chang* 715
- Multidimensional set-theoretic feature recognition  
*S. Parry-Barwick and A. Bowyer* 731
- Smooth piecewise biquartic surfaces from quadrilateral control polyhedra with isolated *n*-sided faces  
*S. L. Lee, H. H. Tan and A. A. Majid* 741
- Deterministic tolerance synthesis: a comparative study  
*A. Kusiak and C.-X. Feng* 759
- Design environment for the design of mechanical drive units  
*R. Žavbi and J. Duhovnik* 769
- Constructing face octrees from voxel-based volume representations  
*R. Juan-Arinyo and J. Solé* 783

## November

- CAD salary and employment study  
*G. Vazzana and D. Bachmann* 795
- Offsetting operations via closed ball approximation  
*A. Z. Gurbuz and I. Zeid* 805
- Topological method for loop detection of surface intersection problems  
*Y. Ma and R. C. Luo* 811
- Relational geometric synthesis: Part I—framework  
*J. S. Letcher Jr, D. M. Shook and S. G. Shepherd* 821
- Volume decomposition and feature recognition: Part 1—polyhedral objects  
*H. Sakurai* 833
- Least squares degree reduction of Bézier curves  
*M. Eck* 845
- GNOMES: an object-oriented nonmanifold geometric engine

*R. D. Sriram, A. Wong and L.-X. He* 853

## December

- Generating Bézier points for curves and surfaces from boundary information  
*X. Ye* 875
- Five-axis NC cylindrical milling of sculptured surfaces  
*X.-W. Liu* 887
- Biquartic C<sup>1</sup>-surface splines over irregular meshes  
*J. Peters* 895
- On editability of feature-based design  
*X. Chen and C. M. Hoffmann* 905
- Offsetting surface boundaries and 3-axis gouge-free surface machining  
*K. Tang, C. C. Cheng and Y. Dayan* 915
- An adaptive method for smooth surface approximation to scattered 3D points  
*H. Park and K. Kim* 929

## Author index

- Ahluwalia, R. S. 627
- Au, C. K. 85
- Aumann, G. 293
- Bachmann, D. 795
- Banks, D. L. 353
- Barker, S. M. 311
- Bogacki, P. 651
- Bose, P. 455
- Bouma, W. 487
- Bowyer, A. 731
- Bradley, C. 471
- Cai, J. 487
- Cavendish, J. C. 703
- Chan, K. 163
- Chang, T.-C. 65, 715
- Chang, Y.-K. 553
- Chen, X. 695, 905
- Cheng, C. C. 915
- Chou, J. J. 303
- Dayan, Y. 915
- Dietz, R. 27
- Dobson, G. T. 139
- Dori, D. 243
- Duhovnik, J. 769
- Dutta, D. 573
- Eck, M. 845
- Elber, G. 283, 465
- Encarnação, M. 559
- Fang, L. 48
- Feng, C.-X. 343, 759
- Flasiński, M. 403
- Fudos, I. 487
- Fuhr, R. D. 95
- Goodman, T. N. T. 479
- Goshtasby, A. 363

Gossard, D. C. 48  
Greiner, G. 559  
Gu, P. 59, 163  
Gupta, S. K. 323  
Gurbuz, A. Z. 805

Hagen, H. 545  
Hahmann, S. 545  
He, L.-X. 853  
He, Q. 553  
Hoffmann, C. 487  
Hoffmann, C. M. 695, 905  
Hoschek, J. 27  
Hsieh, L. 95  
Hwang, I.-K. 605

Ji, Q. 435  
Joe, B. 209  
Juan-Arinyo, R. 783  
Juhász, I. 587  
Jüttler, B. 27

Kallay, M. 95  
Kappel, M. R. 595  
Khosla, P. 223  
Kim, D.-S. 605  
Kim, K. 929  
Kim, M.-S. 193, 385  
Klein, R. 559  
Koh, A. S. 75  
Kolb, A. 277, 559  
Kruth, J. P. 663  
Kumar, S. 509  
Kumar, V. 573  
Kurfess, T. R. 353  
Kusiak, A. 343, 759

Lai, Y.-T. 65  
Lamoussin, H. J. 139  
Lawrence, K. L. 637  
Lee, K. 255  
Lee, S. L. 741  
Lee, Y.-S. 715  
Lee, Y. T. 75  
Letcher Jr, J. S. 821  
Li, S. Z. 235  
Lim, H. S. 255  
Lim, S.-B. 193  
Liu, B.-D. 65  
Liu, X.-W. 887  
Luo, R. C. 811  
Luo, X. 615

Ma, W. 663  
Ma, Y. 811  
Majid, A. A. 741  
Manocha, D. 509  
Marefat, M. M. 435  
Martini, K. 181  
Mattikalli, R. 223  
Milroy, M. J. 471  
Moreton, H. P. 523  
Mudur, S. P. 41  
Muthukrishnan, S. N. 637

Nam, K.-W. 385  
Nambiar, R. V. 637  
Nau, D. S. 323  
Nigam, S. D. 6

Ong, B. H. 479

Paige, R. 487  
Parida, L. 41  
Park, B.-J. 605  
Park, H. 929  
Parry-Barwick, S. 731  
Peters, J. 895  
Pfeifle, R. 559  
Piegl, L. 101  
Piegl, L. A. 16

Qin, H. 111

Reddy, J. M. 677  
Richard, A. M. 16  
Rockwood, A. P. 553

Sakurai, H. 833  
Sánchez-Reyes, J. 263  
Schreiber, T. 545  
Seidel, H.-P. 277, 559  
Shepherd, S. G. 821  
Shook, D. M. 821  
Slusallek, P. 559  
Solé, J. 783  
Soni, B. K. 147  
Sriram, R. D. 853  
Stelson, K. A. 615  
Suh, H. 627

Tan, H. H. 741  
Tang, K. 915  
Terzopoulos, D. 111  
Tiller, W. 101  
Tombre, K. 243  
Toussaint, G. 455  
Turkiyyah, G. M. 677  
Turner, J. U. 6

van Overveld, C. W. A. M. 377  
Vazzana, G. 795  
Vickers, G. W. 471

Waggenspack Jr, W. N. 139  
Wagner, M. G. 129  
Wagner, P. H. 615  
Wang, L.-Y. 65  
Weinstein, S. E. 651  
Weir, D. J. 471  
Wong, A. 853

Xu, Y. 223, 651

Yan, X. 59  
Ye, X. 875  
Yu, TY 147  
Yuen, M. M. F. 85

Zavbi, R. 769  
Zeid, I. 805

## Keyword index

3D vector fields 811  
5-Axis machining 715

Adaptive meshing 235  
Adaptive refinement 637

Algorithms 85, 455, 929  
Analysis 523  
Assembly modelling 181  
Assembly planning 223

B-spline surfaces 663  
B-splines 101, 741  
Bézier and B-spline volumes 553  
Bézier curve 845  
Bézier curves 587, 651, 875  
Bézier patches 875  
Bézier representation 741  
Bézier surfaces 465, 509  
Blending 293, 895  
Boolean operations 695  
Boundary trimming 695  
Bounds 479  
Box splines 479  
Brush sweeps 193  
Building design 181

C<sup>1</sup> surface 895  
C<sup>2</sup> continuity 277  
CAD 795  
CAD models 243  
Cell decomposition 833  
Change of basis 875  
Circles 303  
Circular arcs 303  
Closed balls 805  
Collaborative product development 853  
Computational fluid dynamics 147  
Computational geometry 209, 311, 455  
Computer-aided geometric design 821  
Computer-aided manufacturability analysis 323  
Computer-aided process planning 435  
Concurrent engineering 627  
Confidence region 353  
Constrained Delaunay triangulation 929  
Constrained least squares approximation 845  
Constrained Legendre polynomials 845  
Constraint solving 487  
Constraint-based CAD 905  
Constraint-based design 343  
Constructive solid geometry models 731  
Control points 85  
Conversions 783  
Coons-Boolean sum patches 875  
Coons-Hermite Cartesian sum patches 875  
Corner cutting 895  
Critical points 811  
Curvature analysis 465, 545  
Curvature continuity 293  
Curve blending 385  
Curve fitting 615  
Curves 605  
Curves and surfaces 85, 101  
Cylindrical milling 887  
Cylindricity 353

- Data compression 929
- Data interpolation 48
- Defect modelling 353
- Deformable models 111
- Degree reduction 101, 651, 845
- Delaunay triangulation 677
- Design environment 769
- Design for manufacturability 323
- Design model 769
- Developable and ruled surface 283
- Differential geometry 559
- Direct volume rendering 553
- Divide-and-conquer paradigm 41
  
- Economization 651
- Employment 795
- Endpoint constraints 845
- Engineering drawings 243
- Envelope 915
- Euler angles 75
- Evidential reasoning 435
  
- Face octrees 783
- Facial profiles 139
- Fast prototyping 283
- Feature based data fitting 139
- Feature interaction and modification 627
- Feature recognition 435, 731, 833
- Feature semantics 695
- Feature-based CAD 905
- Feature-based design 703
- Feature-based models 323
- Features 343
- Finite element methods 637
- Finite-element method 209
- Five-axis NC machining 887
- Font design 193
- Form features 403, 731
- Freeform deformation 703
- Freeform surfaces 59
- Fuzzy logic 311
  
- Gender 795
- Generalized stereographic projection 27
- Generative CAD representation 905
- Geometric constraints 181
- Geometric modelling 363, 377, 741, 805, 929
- Gouging 915
- Graphs 487
- Gravity casting 455
- Grid generation 147
  
- Helices 587
- Hermite curves 875
  
- Incremental feature generation 627
- Interpolation 277, 663
- Interrogation 523
  
- Intersecting features 833
- Intrinsic geometry 615
  
- Kinematic mapping 129
  
- Loop detection 811
  
- Mechanical drive unit 769
- Mechanical engineering 243
- Medial axis transforms 677
- Mesh generation 209
- Motion planning 223
- Motions 129
  
- NC machining 915
- Neural networks 59
- Nonlinear minimization 48
- Nonlinear simultaneous equations 235
- Nonmanifold geometry 853
- Normal ringed surfaces 293
- Numerical control 715
- NURBS 16, 85, 95, 111, 139, 147, 263, 465
- NURBS curves 129
  
- Object-oriented databases 853
- Object-oriented graphics 559
- Offset 915
- Offsetting 805
- Oriental characters 193
  
- Parameterization 663
- Parametric curves 41
- Performance-directed design 65
- Persistent naming 905
- Physical VLSI design 65
- Planar cubics 41
- Plate-based manufacturing 283
- Polyhedral 895
- Positional constraints 85
- Process planning 833
- Product data exchange 875
- Products models 163
  
- Quadric shells 573
- Quality engineering 759
- Quasiconformal patches 263
- Quaternion curves 385
  
- Rational Bézier curves 303
- Rational curves 27
- Rational Gaussian curves and surfaces 363
- Rational polynomials 587, 605
- Rational surfaces 27
- Regularization 48
- Relational geometry 821
- Rendering 509
  
- Representation schemes 343
- Reverse engineering 59, 471
- Robotics 223
- Rotation 75, 385
  
- Salary 795
- Scattered data points 277
- Scientific visualization 553
- Sculptured surface machining 715
- Sculptured surfaces 887
- Shading 595
- Shape grammars 403
- Shapes 363
- Sheet modelling 255
- Shells 255
- Single-valued functions 703
- Smoothing 377
- Smoothing splines 615
- Solid modelling 6, 263, 573
- Solid models 403
- Spline mesh 895
- Statistical methods 6
- Statistical tools 759
- STEP 163
- Stitching 471
- Surface 523
- Surface approximation 929
- Surface blending 111
- Surface interrogation 545, 559
- Surface intersections 573
- Surface modelling 821
- Surface sampling 235
- Surface smoothing 471
- Surface subdivision 479
- Surfaces 377
- Survey 795
- Swept volume 915
- Symbolic layout compaction 65
  
- Tensor-product splines 895
- Tessellation 16
- Tetrahedral meshes 637
- Tolerance synthesis 759
- Tolerances 6
- Topological ID 905
- Topology 311
- Triangular Bézier patches 929
- Trimmed NURBS 509
  
- Vertex-degree 895
- Visualization 16, 545
- Volume data 783
- Voronoi diagrams 605, 677
  
- Wages 795
  
- Calendar** 159, 319, 503, 567, 869, 943
- Editorial** 2, 83, 507, 571
- Letter to the Editors** 941



